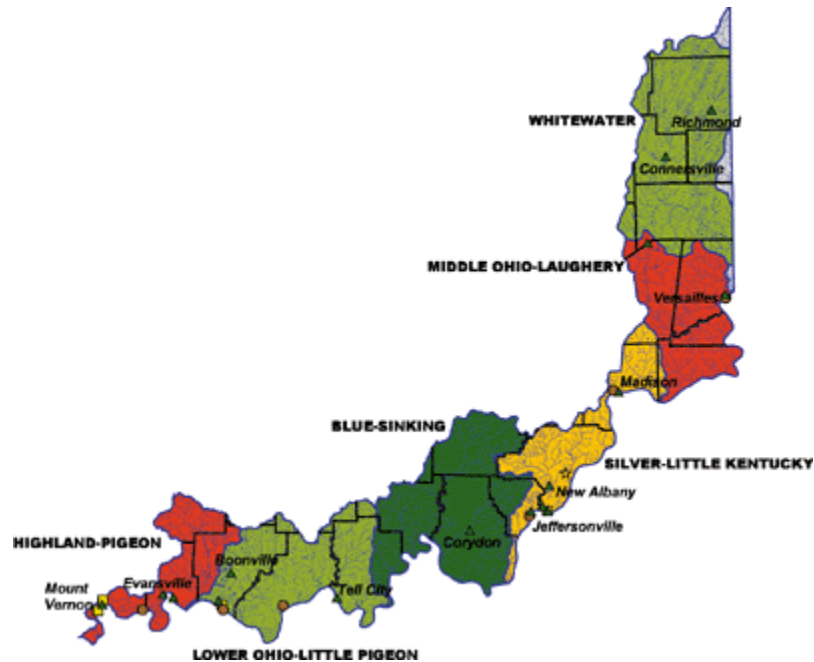


Watershed Restoration Action Strategy for the Silver-Little Kentucky Watershed

Part II: Concerns and Recommendations



Prepared for
Indiana Department of Environmental Management
Office of Water Quality
Watershed Management Section

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Table of Contents

Table of Contents	2
Part II, FOREWORD	1
Part II, Chapter 1: Concerns and Recommendations	5
1. Water Quality Concerns and Priority Issues Identified by Stakeholder Groups	5
Natural Resources Conservation Service	5
Soil and Water Conservation Districts	5
Historic Hoosier Hills RC & D, Inc.	5
Hoosier River Watch	5
Indiana Karst Conservancy	6
River Fields, Inc.	6
Clark County SWCD	6
Clarks Valley Land Trust	6
Part II, Chapter 2: Water Quality Concerns and Priority Issues Identified by State and Federal Agencies	7
Indiana's Unified Watershed Assessment (UWA)	7
Part II, Chapter 3: Identification of Impaired Waters	9
Part II, Chapter 4: Priority Issues and Recommended Management Strategies	10
4.1 Data/Information and Targeting	10
4.2 Streambank Erosion and Stabilization	10
4.3 Failing Septic Systems and Straight Pipe Discharges	10
4.4 Water Quality - General	11
4.5 Fish Consumption Advisories	11
4.6 Nonpoint Source Pollution - General	11
4.6.1 Nonpoint Source Pollution- Education and Outreach	12
4.7 Point Sources - General	12
Part II, Chapter 5: Future Expectations and Actions	12
5.1 Expectations and Measuring Progress	12
5.2 Expected Revisions and Amendments	12
5.2.1 Short Term Revisions and Amendments	12

<u>5.2.2 Long Term Revisions and Amendments</u>	13
<u>5.3 Review of the Watershed Restoration Action Strategy</u>	13
<u>Part II Tables</u>	13

Part II, FOREWORD

The Silver-Little Kentucky Watershed Restoration Action Strategy (WRAS) is intended to be a living document designed to assist restoration and protection efforts of stakeholders in their sub-watersheds. As a "living document" information contained within the WRAS will need to be revised and updated periodically.

The WRAS is divided into two parts: Part I, Characterization and Responsibilities and Part II, Concerns and Recommendations.

The first draft of the Silver-Little Kentucky WRAS was released for public review during the spring of 2002. A 60-day public comment period followed the public meetings at which this WRAS document was introduced. This final version of the WRAS includes public comments received during the 60-day comment period. For comments to be included in the final version, they were required to be written and submitted to WHPA, Inc. (the firm contracted to produce this WRAS) during the comment period.

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Part II, Chapter 1: Concerns and Recommendations

Part II of the Watershed Restoration Action Strategy discusses the water quality concerns identified for the Silver-Little Kentucky Watershed and lists recommended management strategies to address these concerns.

Part II includes:

Section 1 - Water Quality Concerns and Priority Issues Identified by Stakeholder Groups

Section 2 - Water Quality Concerns and Priority Issues Identified by State and Federal Agencies

Section 3 - Identification of Impaired Waters

Section 4 - Priority Issues and Recommended Management Strategies

Section 5 - Future Actions and Expectations

1. Water Quality Concerns and Priority Issues Identified by Stakeholder Groups

The Silver-Little Kentucky watershed contains potential stakeholder groups that have different missions (contact information is included in Appendix C). Many of these groups have a long history of working in the Silver-Little Kentucky watershed. The following discussion briefly describes some of the watershed groups.

Natural Resources Conservation Service

The Natural Resources Conservation Service (NRCS), under the U.S. Department of Agriculture (USDA), provides leadership in a partnership effort to help people conserve, maintain, and improve our natural resources and environment. The NRCS offers landowners financial, technical, and educational assistance to implement conservation practices on privately owned land. Using this help, farmers, ranchers, and forest landowners apply practices that reduce soil erosion, improve water quality, and enhance crop land, forest land, wetlands, grazing lands, and wildlife habitat. Incentives offered by USDA promote sustainable agricultural and forestry practices, which protect and conserve valuable farm and forest land for future generations. USDA assistance also helps individuals and communities restore natural resources after floods, fires, or other natural disasters.

Soil and Water Conservation Districts

Local Soil and Water Conservation Districts (SWCD) assist land users and residents in the protection and improvement of the local environment. SWCDs can provide technical and financial assistance to local watershed conservation groups.

Historic Hoosier Hills RC & D, Inc.

The vision of Historic Hoosier Hills Resource Conservation and Development is to serve as a catalyst to motivate local people to solve overall economic and natural resources problems of the area, and to properly develop, utilize, and conserve our natural and human resources. Projects have included implementing an EQIP Grant to provide alternative livestock watering systems as a tool to promote Management Intensive Grazing in southeastern Indiana, and educational activities such as development of a short video which encourages proper harvesting techniques for Southern Indiana hardwoods.

Hoosier River Watch

Hoosier Riverwatch is a state-sponsored water quality monitoring initiative. The program was started in 1994 to increase public awareness of water quality issues and concerns by training volunteers to monitor stream water quality. Hoosier Riverwatch collaborates with agencies and volunteers to:

- Increase public involvement in water quality issues through hands-on training of volunteers in stream monitoring and cleanup activities.
- Educate local communities about the relationship between land use and water quality.
- Provide water quality information to citizens and governmental agencies working to protect Indiana's rivers and streams.

Indiana Karst Conservancy

The Indiana Karst Conservancy is a non-profit organization dedicated to the preservation and conservation of Indiana's unique karst features. The IKC was formed by concerned individuals when it was apparent that no similar group was actively protecting such features for their inherent geological, biological, and archaeological importance. The purposes of the IKC are the management, protection, and acquisition of the karst areas in Indiana. The IKC also supports research and promotes education related to karst and its appropriate use.

River Fields, Inc.

River Fields protects, preserves, and enhances natural and cultural resources of the Ohio River between Westport and West Point on both sides of the River. River Fields advocates appropriate land and water use and urban design. This organization conserves land by acquiring interests in property along the Ohio River and its tributaries. It also educates the community and promotes public involvement in environmental stewardship.

Clark County SWCD

The mission of the Clark County SWCD is to inspire community involvement through teaching, leading and providing technical assistance to keep our natural resources abundant, fertile and clean. In the agricultural community, the Clark County SWCD promotes the development of buffer zones and provides conservation technical information and information on conservation programs that are a source of funding.

The Clark County SWCD addresses urban-related challenges, such as stormwater runoff, erosion, and water pollution from automobile oil and suburban lawns, through education, leadership and providing technical assistance. The Backyard Conservation program targets education activities to urban and suburban dwellers. The District, through IDNR, Division of Soil Conservation, provides technical assistance for urban erosion control (Rule 5). This program requires developers to establish and implement an erosion control plan on new developments disturbing 5 or more acres of land. The District has also recently received a 319 grant to promote urban nonpoint source pollution prevention. The District, through the USDA Natural Resources Conservation Service, also provides technical advisory assistance to County and City drainage boards, local planning commissions and other units of government upon request.

The SWCD's Education Coordinator offers assistance and educational resources to schools and community groups, and provides leadership in the District's conservation education/information program. The SWCD's Natural Resources Educational Facility is home to the 50 Trees of Indiana Exhibit, a wetland, the path of a waterdrop exhibit, a butterfly garden and other wildlife plantings and habitat areas. The area is used throughout the year for group programs as well as enjoyed by thousands during the county 4-H fair.

The Clark County SWCD is currently working with the Clark County Solid Waste Management District to set up a household hazardous waste disposal facility which will be open in the fourth quarter of 2002. This will reduce the amount of household hazardous wastes that are improperly disposed of by pouring down the drain or on the ground, negatively affecting water quality. Once the facility is open, the Solid Waste District will be able to assist in quantifying the types and amounts of household hazardous waste diverted from the watershed through collection at the facility.

Clarks Valley Land Trust

Clark's Valley seeks to preserve and enhance the rural character and natural integrity of land in Clark County and neighboring areas through land stewardship. Clark's Valley, affiliated with the Clark County Soil and Water Conservation District, works hand-in-hand with landowners to develop conservation easements to help protect farmland, sensitive areas, and historic sites.

Part II, Chapter 2: Water Quality

Concerns and Priority Issues Identified by State and Federal Agencies

This section presents the combined efforts of state and federal agencies, and universities (such as IDEM, IDNR, USDA-Natural Resources Conservation Service, Ohio River Valley Water Sanitation Commission, Purdue University, Indiana University, Indiana Geologic Survey, and US Geological Survey) to assess water quality concerns and priority issues in the Silver-Little Kentucky Watershed. This multi-organization effort formed the basis of the Unified Watershed Assessment for Indiana. At this time, the Unified Watershed Assessment has been completed for 1998 and updated for 2000-2001.

Indiana's Unified Watershed Assessment (UWA)

The UWA workgroup gathered a wide range of water quality data that could be used to characterize Indiana's water resources. These data were used in 'layers' in order to sort the 8-digit HUC watersheds according to the present condition of the water in lakes, rivers, and streams. The workgroup used only those data which concerned the water column, organisms living in the water, or the suitability of the water for supporting aquatic ecosystems. Each 'layer' of information/data was partitioned by percentiles into scores. The scores ranged between one and five, with a score of one indicative of good water quality or minimum impairment, and a score of five indicating heavily impacted or degraded water quality.

The data layers used in the 1998 and the 2000-2001 update include:

- Lake Fishery: Large-mouth bass community information for lakes
- Stream Fishery: Small-mouth bass community information for streams
- Aquatic Life Use Support: The "livability" of the water column for aquatic life, determined from evaluation of chemical and physical water data, and assessment of aquatic life
- Fish Consumption Advisories: Site specific advisories based on current data
- Fish Index of Biotic Integrity: Based on fish community diversity and fish health
- Qualitative Habitat Evaluation Index: Measure of whether the aquatic habitat is suitable for diverse communities, based on visual observations
- Lake Trophic Scores: Indicator for the rate at which a lake is 'aging' due to inputs of nutrients and other factors
- Sediment Potential: Indicator of potential sediment input to waterbodies in the watershed

The sources and additional information for these data layers include:

- Lake Fishery: From IDNR fisheries surveys of lakes and reservoirs from 1972 to 1994. Raw scores were averaged for all lakes in the watershed
- Stream Fishery: From IDNR fisheries surveys of streams from 1970 to 1994. Raw scores were averaged for all streams in the watershed
- Aquatic Life Use Support: IDEM, Office of Water Quality, Assessment Branch
- Fish Consumption Advisories: ISDH and IDEM, Office of Water Quality, Assessment Branch
- Fish Index of Biotic Integrity: IDEM, Office of Water Quality, Assessment Branch
- Qualitative Habitat Evaluation Index: IDEM, Office of Water Quality, Assessment Branch
- Lake Trophic Scores: Indiana Clean Lakes Program through IDEM, Office of Water Quality, Assessment Branch. This score was based on information gathered from sampling conducted in the 1970's and 1980's

During summer 1999 the UWA workgroup used additional layers of information to identify the resource concerns and stressors for each of the 361 11-digit watersheds in Indiana. Examination of the human activities that have the potential to impact the ecosystem will help planners to focus on those areas where restoration may be most critical.

Organizations can identify opportunities to use their programs and resources to address those areas.

This focusing process will illuminate areas where the interests of two or more partner agencies may converge. It is intended that this will lead to more effective allocation of resources for restoration and protection activities. At the local level, this information can assist groups to prioritize watershed activities and provide some discussion points for planning.

This amended assessment has the following benefits:

- Provides a logical process for targeting funds, which may be expanded or updated without changing the basic framework.
- Provides information at a finer resolution (11-digit hydrologic units) to agencies and local groups interested in watershed assessment.
- Identifies data gaps.
- Can be used as a compliment to other assessments, such as the 305(b) Report and 303(d) List.

Table 2-1 and Figure 2-1 show the results of the 2000-2001 UWA for the Silver-Little Kentucky watershed (NRCS & IDEM 2000).

Part II, Chapter 3: Identification of Impaired Waters

Section 303(d) of the Clean Water Act requires states to identify waters that do not or are not expected to meet applicable water quality standards with federal technology-based standards alone. States are also required to develop a priority ranking for these waters taking into account the severity of the pollution and the designated uses of the waters. Indiana's 303(d) list was approved by EPA on February 16, 1999.

Once the Section 303(d) list and ranking of waters is completed, the states are required to develop Total Maximum Daily Loads (TMDLs) for these waters in order to achieve compliance with the water quality standards. The TMDL is an allocation that determines the point and nonpoint source (plus margin of safety) load reductions required in order for the waterbody to meet water quality standards. IDEM's Office of Water Quality has and continues to perform point source waste load allocations for receiving waters. Part I of the WRAS briefly outlines IDEM's strategy for developing TMDLs.

Table 0-1 shows the Silver-Little Kentucky Watershed waterbodies that are on Indiana's 1998 Clean Water Act Section 303(d) list submitted and approved by EPA (IDEM 1998, Figure 3-1). The 2002 draft 303(d) list has been completed and the final list will be released in October 2002. The draft 2002 list is not included in this document, but is available from IDEM's Office of Water Quality (<http://www.state.in.us/idem/water/planbr/wqs/303d.html>)

Part II, Chapter 4: Priority Issues and Recommended Management Strategies

Part I provided the existing water quality information for the Silver-Little Kentucky Watershed and Part II lists priority issues and concerns from local, state, and federal stakeholders in the watershed. This section pulls together the priority issues and concerns held by all stakeholders and recommends management strategies. Underlying all discussions of priority issues and concerns is the fact that improving water quality in the Silver-Little Kentucky Watershed will also enhance the natural and recreational values of the Silver Creek and Fourteenmile Creek. Each subsection below focuses on a single priority issue.

4.1 Data/Information and Targeting

The success in restoring water quality in the Silver-Little Kentucky Watershed is fundamentally based on identifying the specific geographic problem areas; identifying all sources contributing to the impairment of the waterbody; and quantifying the contribution of a pollutant by each source.

Recommended Management Strategy 1: Numerous data collection efforts are ongoing in the Silver-Little Kentucky Watershed. This information should be used in prioritizing and targeting specific problems and geographic areas in the watershed. The scale at which targeting and prioritization should occur is the 14-digit HUC watershed area (Figure 2-2 of Part I). Targeting and prioritization will require input from stakeholders living in those geographic areas. The purpose of prioritization and targeting is to enhance allocation of resources in the effort of improving water quality.

Recommended Management Strategy 2: Through the development of Total Maximum Daily Loads (TMDLs) for impaired waterbodies in the Silver-Little Kentucky Watershed, all sources contributing to the impairment of a waterbody will be identified and quantified in terms of their contribution to the waterbody. This includes gathering more data and information on nonpoint sources of water pollution. Throughout the TMDL process, information and feedback from watershed stakeholders will be required in order to generate appropriate allocation scenarios. The result of developing TMDLs will be an understanding of the impact of nonpoint sources on water quality in the watershed.

4.2 Streambank Erosion and Stabilization

The cutting and erosion of streambanks within the Silver-Little Kentucky Watershed is a major concern. This cutting and erosion increases the sediment load in waterbodies and directly impacts the scenic and recreational values of waterbodies in the Silver-Little Kentucky Watershed. Streambank cutting and erosion is often a function of many factors that include stream energy and velocity, flooding, and land management. Increased drainage in headwater streams and ditches increases stream energy during rainfall events and often leads to increased streambank cutting and erosion downstream. Land clearing and urban development also impact volume and velocity of runoff. Hence, this problem is not easily solved.

Recommended Management Strategy 1: Structural stabilization of specific streambank areas in the Silver-Little Kentucky watershed may solve problems on a temporary basis. However, a comprehensive understanding of drainage, stream flows and energies, and land management practices is required to adequately approach this problem. Conservation partners (local, state, and federal) are actively working within their specific geographic areas (typically at the county level); however, this may not facilitate solving the streambank cutting and erosion problems because efforts may not be coordinated between headwater and downstream areas. For example, drainage should take into account the work and efforts of downstream partners to reduce flooding and streambank cutting. Conservation efforts should be in the context of watersheds and span county boundaries in order to account for downstream impacts. Local Drainage Boards, Planning and Zoning Boards, and County Commissioners could effectively address this issue by involving local stakeholders in the decision making process and approaching the issue on a watershed basis.

4.3 Failing Septic Systems and Straight Pipe Discharges

Local county health departments and other stakeholders have identified failing septic systems and straight pipe discharge from septic tanks as significant sources of water pollution in the Silver-Little Kentucky watershed. Straight pipe discharges from septic tanks and septic tanks connected to drainage tiles are illegal (327 IAC 5-1-1.5); however, these practices still exist in the Silver-Little Kentucky watershed.

Recommended Management Strategy 1: The direct impact of communities discharging their septic tank effluent to waterbodies needs to be adequately characterized. This will involve coordination between the Office of Water Quality, local health departments, Indiana State Department of Health, and other stakeholders. The choice to eliminate the illegal discharges will be a cooperative effort between homeowners and local, state, and federal stakeholders.

Recommended Management Strategy 2: Local planning, zoning, and health ordinances could be adopted or strengthened to address this problem during new development. Existing local ordinances could be enforced more

vigorously to correct problems with existing systems. Both of these strategies will require input from local stakeholders.

Recommended Management Strategy 3: An education/outreach program on the health and environmental risks of septic system discharges, system maintenance, and system function would provide homeowners and others with basic information to better understand the impacts of inadequate systems. This kind of education effort would involve local health departments, Indiana State Department of Health, IDEM, and other stakeholders. For example, the Arrowhead Country RC&D in northwest Indiana is working on a project to demonstrate proper septic system installation.

4.4 Water Quality - General

The Clean Water Act Section 303(d) list presented in Chapter 3 lists impaired waterbodies for the Silver-Little Kentucky watershed.

Recommended Management Strategy: The Clean Water Act requires states to complete TMDLs for waterbodies listed on the Section 303(d) list. The Office of Water Quality is currently evaluating and exploring the modeling process and data needs required to complete TMDLs for the Section 303(d) listed waterbodies. Completion of a TMDL will involve loading allocations of a pollutant to both point and nonpoint sources. The development of TMDLs will involve meetings with stakeholder groups linked to the Section 303(d) waterbodies. As TMDLs are developed, this Watershed Restoration Action Strategy will be amended to incorporate the final TMDLs.

4.5 Fish Consumption Advisories

As noted in Part I and Part II, fish consumption advisories are concerns within the Silver-Little Kentucky watershed.

Recommended Management Strategy 1: In many cases, the source of the contamination is unknown and may be from atmospheric deposition or some unknown discharge. To address this concern, the cause or source must be identified. Until that is accomplished, the fish consumption advisories should be followed.

4.6 Nonpoint Source Pollution - General

Nonpoint source pollution contributions are often difficult to assess or quantify. They can include sediment deposition from soil erosion, nutrient runoff from animal wastes and commercial fertilizer, herbicide and insecticide runoff, and oil or fuel waste runoff. Degraded wetlands may also contribute to nonpoint source pollution, as their capacity for abatement of runoff and the associated pollutants is diminished or lost. Nonpoint pollution can emanate from agricultural as well as urban lands. Currently, loadings of nonpoint source pollutants to water are often inferred by examination of land use practices, without actual measurements. In addition, the actual water quality impairments related to nonpoint source pollutants have not been well characterized in the Silver-Little Kentucky watershed. Finally, very few regulatory control mechanisms exist to control nonpoint source pollution.

Recommended Management Strategy 1: Through the TMDL development process, the Office of Water Quality will identify, assess, and quantify nonpoint source pollutant loadings to impaired waterbodies. In order to accomplish this task, the Office of Water Quality will work closely with local, state, and federal stakeholders at the watershed and subwatershed level. Loading scenarios for nonpoint source pollutants will be developed by the Office of Water Quality and reviewed by local, state, and federal stakeholders. Implementation of nonpoint source controls will involve a blend of funding assistance and regulatory action, where applicable.

Recommended Management Strategy 2: Numerous funding mechanisms, such as Conservation Reserve Program, Environmental Quality Incentive Program, Lake and River Enhancement program, and 319(h) grants, exist to promote practices to reduce nonpoint source pollution in the watershed. To more efficiently and effectively address nonpoint source pollution in the watershed, the prioritization and targeting discussed previously in Part II should be used to allocate further application of resources.

Recommended Management Strategy 3: The management of urban nonpoint sources can be addressed through effective land use planning and site design. Designs that incorporate less impervious area and more natural infiltration areas have proven effective in reducing urban nonpoint pollution. Local stakeholders working with local planning and zoning authorities, and developers, should implement more stringent site design requirements to reduce nonpoint source contaminants. This effort would be supported by the state and federal stakeholders.

Recommended Management Strategy 4: Practicing the following management measures for NPS pollution abatement may significantly reduce the sediment, nutrient, pesticide and other pollutant contributions to surface waters:

- 1) Protection of Wetlands and Riparian Areas of those serving a significant NPS pollution abatement function
- 2) Restoration of Wetlands and Riparian Areas of preexisting functions in damaged and destroyed areas, esp. where the systems will serve significant NPS pollution abatement function
- 3) Vegetated Treatment Systems (VTS) to promote use of constructed wetlands and vegetated filter strips where these systems will serve significant NPS pollution abatement function

*The information on degraded wetlands as potential contributors to nonpoint source pollution and the management measures for NPS pollution abatement is compiled from the USEPA Draft Guidance entitled "National Management

4.6.1 Nonpoint Source Pollution- Education and Outreach

This Watershed Restoration Action Strategy is a beginning point for education and outreach efforts. It compiles existing knowledge about the water resources in this watershed and presents it to the stakeholders who live in the Silver-Little Kentucky watershed. It brings to a public forum the available information and local concerns. However, the education process does not stop with the publication of this document.

Recommended Management Strategy: Local stakeholders, in cooperation with state and federal agencies, need to seek additional information on water quality concerns and issues addressed in this document and make that information available to the public. Additionally, the problems associated with septic failures, soil erosion, land use issues, and riparian zones can be emphasized through meetings, training sessions, and stakeholder group discussions. Field days are excellent ways to present information and encourage discussion. Use of experts with strong background knowledge coupled with local sponsors is an effective method to convey solutions to these problems.

4.7 Point Sources - General

There are 129 active NPDES permitted dischargers, and 23 CSO discharge points in the Silver-Little Kentucky watershed. Additionally there are illegal point source discharges, such as tiles discharging septic tank effluent that exist in the watershed.

Recommended Management Strategy: The Permitting and Compliance Branch of the Office of Water Quality is responsible for issuing and monitoring compliance of NPDES permit holders. Clearly, more emphasis and resources are needed to identify and correct illegal point sources and noncomplying point sources. Improving compliance of NPDES dischargers and identifying illegal dischargers will involve fostering a working relationship with other local, state, and federal stakeholders to monitor compliance and report unusual discharges or stream appearance. In regards to illegal discharges, the Office of Water Quality will work with local, state, and federal stakeholders to identify and eliminate these sources of water pollution.

Part II, Chapter 5: Future Expectations and Actions

As discussed in Part I, this Watershed Restoration Action Strategy is intended to be a fluid document that will be revised or amended as new information becomes available. Section 5.1 discusses expectations derived from the Strategy and how progress will be measured. Specific revisions and amendments to the Watershed Restoration Action Strategy are discussed in Section 5.2. Finally, the Watershed Restoration Action Strategy will be reviewed by all stakeholders before it becomes final, as described in Section 5.3.

5.1 Expectations and Measuring Progress

The Silver-Little Kentucky Strategy provides a starting point to address water quality concerns held by local, state, and federal stakeholders. Part II provides recommended management strategies to address these concerns. Through cooperative efforts with stakeholders, all of the recommended management strategies listed will begin implementation by the summer of 2003.

Measurement of progress is critical to the success of any plan. Water quality improvements will not take place overnight. Measuring of progress in terms of water quality will be provided through the Office of Water Quality Assessment Branch's rotating basin monitoring strategy.

5.2 Expected Revisions and Amendments

This Watershed Restoration Action Strategy is intended to provide a starting point to improve water quality and measure the improvement. Hence, this document will require revisions and amendments as new information becomes available. The future revisions and amendments have been divided into those that are expected within the next year (Section 5.2.1) and those that will occur over a long-term basis (Section 5.2.2).

5.2.1 Short Term Revisions and Amendments

The most significant revisions and amendments will likely occur during 2002 and after, as a result of stakeholder review.

5.2.2 Long Term Revisions and Amendments

The Office of Water Quality is moving toward adopting a watershed management approach to solve water quality problems. Part of the watershed approach is the use of a rotating basin management cycle. The Assessment Branch of the Office of Water Quality has already adopted this rotating basin cycle in its intensive monitoring and assessment of Indiana waterbodies (this is in addition to the already established fixed station monitoring which occurs on a monthly basis). The Watershed Restoration Action Strategy may be revised or amended when sufficient information becomes available.

5.3 Review of the Watershed Restoration Action Strategy

Before this Watershed Restoration Action Strategy becomes final, it will undergo rigorous review. The first stage of review will be performed internally by the Office of Water Quality. Once the Watershed Restoration Action Strategy has been revised to address internal Office of Water Quality comments, it will be circulated to local, state, and federal stakeholders in the watershed. Written comments from local, state, and federal stakeholders will be addressed and the Watershed Restoration Action Strategy will again be revised to incorporate applicable comments. Once internal and external comments have been addressed, the final version of the Watershed Restoration Action Strategy will be released.

Part II Tables

TABLE 2-1: UNIFIED WATERSHED ASSESSMENT FOR THE SILVER-LITTLE KENTUCKY WATERSHED, 2000-2001

Hydrologic Unit Scores for Each Parameter Used in the Unified Watershed Assessment [2000-2001]															
	Measured Parameters														
11 Digit Hydrologic Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
05140101020	nd	nd	nd	nd	nd	nd	nd	1	3	1	2	1	3	1	1
05140101030	nd	nd	nd	2	nd	nd	nd	2	4	1	2	2	2	1	1
05140101040	3	nd	nd	nd	nd	nd	nd	4	4	1	3	2	3	1	1
05140101060	nd	nd	nd	nd	nd	nd	nd	2	4	1	2	2	2	1	1
05140101070	nd	nd	nd	nd	nd	nd	nd	4	4	1	2	2	2	1	1
05140101080	nd	nd	nd	nd	nd	nd	nd	2	4	1	4	3	2	1	1
05140101100	nd	nd	nd	nd	nd	nd	nd	2	3	1	5	3	2	1	1
05140101120	nd	nd	nd	nd	nd	nd	nd	2	2	1	5	4	2	1	1
05140101130	nd	nd	nd	nd	nd	nd	nd	3	4	2	4	2	3	1	1
05140101140	nd	nd	nd	nd	nd	nd	2	4	4	1	4	2	2	1	1
05140101150	1	nd	nd	nd	nd	nd	nd	5	4	2	4	3	3	1	1

KEY

Parameters:

- 1 - Mussel Diversity and Occurrence
- 2 - Aquatic Life Use Support
- 3 - Recreational Use Attainment
- 4 - Stream Fishery
- 5 - Lake Fishery
- 6 - Eurasian Milfoil Infestation Status
- 7 - Lake Trophic Status
- 8 - Critical Biodiversity Resource
- 9 - Aquifer Vulnerability
- 10 - Population Using Surface Water for Drinking Water
- 11 - Residential Septic System Density
- 12 - Degree of Urbanization
- 13 - Density of Livestock
- 14 - % Cropland

15 - Mineral Extraction Activities

Score range:

1 = good water quality (minimum impairment)

5 = heavily impacted or degraded water quality

nd = no data

(from NRCS & IDEM 2000)

TABLE 0-1: WATERS OF THE SILVER-LITTLE KENTUCKY ON INDIANA'S 1998 303(D) LIST

ID	Waterbody	Parameter of Concern	Priority for TMDL development
IN-0201FCMRC-1998	DEAM LAKE	FCA - MERCURY	2010-2012
IN-0203ECOLI-1998	OHIO RIVER	E. COLI	2000-2004
IN-0203FCPCB-1998	OHIO RIVER	FCA - PCBS	2010-2012
IN-0203LEAD-1998	OHIO RIVER	LEAD	2010-2012
IN-0205ECOLI-1998	OHIO RIVER	E. COLI	2000-2004
IN-0205FCPCB-1998	OHIO RIVER	FCA - PCBS	2010-2012
IN-0207FCMRC-1998	SILVER CREEK	FCA - MERCURY	2010-2012
IN-0207FCPCB-1998	SILVER CREEK	FCA - PCBS	2010-2012
KY21001427-1998	BEARGRASS CREEK	METALS ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN	First Priority
KY21009223-22.1-1998	SPRING DITCH	PATHOGENS	First Priority
KY21010558-1998	GOOSE CREEK	ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN PATHOGENS	First Priority
KY21012402-1998	HITE CREEK	UNKNOWN TOXICITY	First Priority
KY21013710-1998	JERICHO LAKE	NUTRIENTS	Second Priority
KY21015900-1998	LITTLE GOOSE CREEK	ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN PATHOGENS	First Priority
KY21017889-1998	MIDDLE FORK BEARGRASS CREEK	METALS ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN	First Priority
KY21018099-1998	MILL CREEK	HABITAT ALTER. (NON-FLOW) ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN PATHOGENS SILTATION	First Priority
KY21018112-9.7-1998	MILL CREEK CUTOFF	PATHOGENS	First Priority
KY21019123-1998	MUDDY FORK	PATHOGENS	Second Priority
KY21020129-10-1998	OHIO RIVER	UNKNOWN PATHOGENS PCBS PRIORITY ORGANICS	Second Priority
KY21020129-11-	OHIO RIVER	PATHOGENS	Second Priority

1998		PCBS PRIORITY ORGANICS	
KY21021927-01-1998	POND CREEK	CHLORINE NUTRIENTS	Second Priority
KY21022864-1998	REFORMATORY LAKE	NUTRIENTS	First priority
KY21025942-1998	SOUTH FORK BEARGRASS CREEK	ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN PATHOGENS	First Priority

FCA - Fish Consumption Advisory

PCB - Polychlorinated Biphenyls

Hg - Mercury

***Only waters for which fish tissue data support issuance of fish consumption advisories are individually cited above.

The Indiana Department of Health has issued a general fish consumption advisory for all other waters of the state. This advisory was based on extrapolation of the fish tissue data that were available and generally recommends that if no site-specific advisory is in place for a waterbody, the public should eat no more than one meal (8 oz.) per week of fish caught in these waters. Women of child bearing age, women who are breast feeding, and children up to 15 years of age should eat no more than one meal per month. The basis for this general advisory is widespread occurrence of mercury or PCBs (or both) in most fish sampled throughout the state. Please refer to the most recent Fish Consumption Advisory booklet available through the Indiana Department of Health (317/233-7808). Sources of the mercury and PCBs are unknown for the most part, but it is suspected that they result from air deposition.